

Part 214

BY-PRODUCT COKE OVEN BATTERIES

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214.1 Definitions. (a) Charging. The operation that introduces coal into a coke oven, beginning when coal enters the oven and continuing until all charging hole lids are replaced and sealed. Not included is the period when lids are reopened to sweep spilled coal into the oven.

(b) Pushing. The operation that removes coke from a coke oven to a transport car, beginning when the ram enters the oven and continuing until the ram begins to retract.

(c) Transport. The operation which moves coke from the coke oven to the quench tower, beginning when the ram begins to retract from the oven and continuing until the transport car enters the quench tower.

(d) Offtake Piping. The pipes or ducts by which the gaseous by-products of coking are transported between the coke oven to a coke oven gas collector main.

214.2 Compliance. By-product coke oven batteries must comply with any applicable emission standard, visible emission limitations and other requirements contained in this Part, unless exempted under section 214.10.

214.3 Coal charging systems. (a) Visible emissions must not exceed 150 seconds from any five consecutive charges at a single battery when measured in accordance with the procedures set forth in subdivisions 214.3(b), (c), (d), and (e).

(b) For the purpose of determining compliance with section 214.3(a) of this Part, visible emissions are those emissions of any degree of opacity greater than zero discharged during the charging of coal to the coke oven, including emissions from the offtake piping, larry car hoppers, drop sleeves, jumper pipes,

charging holes, or any of the oven equipment and tools associated with this operation.

(c) In conveyor-type coal charging systems, the observer will read visible emissions only from the charging holes, offtake piping, charging buggy, drop sleeves, the interface between the charging buggy and the conveyor, the conveyor system, and any other equipment associated with the charging operation subsequent to the coal feed to the conveyor. This procedure will be followed whether the conveyor system is charging the battery with wet or dry coal.

(d) Compliance will be determined by observing and timing with a cumulative stopwatch the visible emissions from each oven charged during a series of consecutive charges of a single battery. The observer will be positioned on the battery top, at a distance of five to ten ovens from the oven being charged. In the event that such a position results in an obstructed view, the observer must assume another position to allow a clear view of the emissions. The cumulative time of visible emissions during the charging of each oven must be recorded. Visible emissions discharged simultaneously from more than one point on the same oven will be timed as a single emission.

(e) Compliance with the emission limit will be determined by summing the cumulative times for any single series of five consecutive charges and comparing this total with the appropriate standard. An obscured charge or other interruptions to the observations being made of a series of charges will not disrupt an otherwise consecutive series in calculating compliance with the emission limit. The longest cumulative time of any visible emission for a single charge in a group of any twenty charges at any battery will be disregarded but will not disrupt any otherwise consecutive series in calculating compliance with the emission limit.

214.4 Coke pushing and transport to quench tower.

(a) A by-product coke oven battery must be equipped with coke pushing and transport to quench tower control equipment to limit particulate emissions to the atmosphere during pushing and transport to the quench tower unless exempted under subdivision 214.10(b). The stack discharge from this system to the outdoor atmosphere shall be limited to particulate emissions of either 0.05 grains per dry standard cubic foot of exhaust gas or 0.05 pounds per ton of coal charged into the oven, whichever is less stringent. Pushing emission control sheds must be limited to a particulate emission of 0.07 lb/ton of coal charged.

(b) The average opacity of emissions from coke pushing and from any transport of coke to the quench tower must be less than 20 percent opacity as measured in accordance with the procedures set forth in subdivision 214.4(c). If uncontrolled quench cars are used to transport coke from a pushing control device to a quench tower, the average opacity of emissions from the uncontrolled car must not exceed 20 percent when measured by the method of subdivision 214.4(c).

(c) Compliance with the opacity standards of subdivision 214.4(b) will be determined by observing and timing any visible emission discharged during the pushing of coke from the oven into the transport car and during the transport of coke to the quench tower. The observer must stand at a distance sufficient to provide a clear view of the pushing and transport operations with the sun oriented in the 140° sector of his back. The opacity of emissions will be computed by averaging the results of twenty-four (24) consecutive opacity observations made at fifteen (15) second intervals. Observations must be made only during the pushing and transport period. A sufficient number of consecutive pushing and transport operations must be observed to accumulate the minimum of twenty-four (24) consecutive opacity readings.

214.5 Wet quench towers. (a) A person may not operate a wet quench tower of a coke oven battery unless it is equipped with a baffle system designed to effectively reduce particulate emissions during quenching.

(b) Except as provided in subdivision 214.5(c), the total dissolved solids concentration of any quench tower make-up water must not exceed 1600 milligrams per liter (mg/l). Compliance with this limit will be determined by taking the arithmetic average of the total dissolved solids concentrations of each of four samples of make-up water obtained at fifteen minute intervals. The total dissolved solids concentration of an individual sample will be determined by the latest American Society for Testing and Materials method or equivalent in which the drying temperature must be 103°C.

(c) Total dissolved solids concentrations from make-up water may exceed 1600 mg/l if it can be shown that particulate emissions from the quench tower do not exceed .45 pounds per ton of coal charged through an emissions test conducted in compliance with subdivision 214.11(c). If such a demonstration is made, the actual average concentration of the quench tower make-up water used during the test will become an acceptable maximum limit for the tested quench tower. If the source owner wants to use make-up water with a higher concentration than used during the quench tower emissions test, additional testing may be required.

214.6 Waste heat (underfire) stacks.. (a) Particulate emissions from any waste heat stack must not exceed 0.050 grains per dry standard cubic foot and the average opacity of emissions from such stack must not exceed 20 percent as measured in accordance with the procedures set forth in subdivision 214.6(b).

(b) For the purpose of determining compliance with subdivision 214.6(a) of this Part, the observer must stand at a distance sufficient to provide a clear view of the waste heat stack with the sun oriented in the 140° sector of his back. The observer will, as much as possible, make his observations from a position where his line of vision is perpendicular to the plume direction. The opacity of emissions will be computed by averaging the results of 24 consecutive opacity observations made at 15 second intervals.

214.7 Oven doors. (a) Door leakage. No more than 10% of all coke oven doors on a single battery including pusher side, coke side, and chuck doors, may emit visible emissions as measured in accordance with the procedure set forth in subdivision 214.7(b).

(b) For the purpose of determining compliance with subdivision 214.7(a) of this Part, visible emissions are those emissions of any degree of opacity greater than zero, observed to be emanating from the oven doors of a battery. An inspection of the coke oven doors will consist of an observer or observers walking the length of a coke battery at a steady pace from a ground level position (25 to 100 feet from the battery). Each door (coke side, push side, and chuck doors) is to be observed during the inspection for only that period of time necessary to determine whether or not there is a visible emission coming from the door. The observer will then shift his attention to the adjacent door, if possible, and check for emissions in the same manner. If a temporary machine obstruction occurs, blocking the view of one or more ovens, those oven(s) will be bypassed and the remaining doors on that side of the battery will be inspected. After the traverse on that side of the battery, the bypassed ovens and only those ovens will be reinspected. Compliance will not be determined if it is not possible to reinspect the blocked ovens. Where the inspector has reason to believe that emissions emanate from a leaking chuck door within a leaking oven door, the emissions will be counted as two leaks. The percentage of leaking doors will be calculated by the following equation:

$$\text{Percentage of Leaking Doors} = \frac{A}{B \times C}$$

A = 100 x (number of leaking doors)

B = number of doors/oven

C = number of inservice ovens/battery

The number of doors/oven is normally three - pusher side, coke side, and chuck. Compliance is determined for all doors in aggregate, not for each separate door type.

(c) Oven door maintenance. Any person operating a by-product coke oven battery must implement the following work practices:

(1) Self-sealing coke oven doors.

(i) Each oven door will be inspected for visible emissions within one hour after the charge. A record will be made of any door leaking one hour after the charge.

(ii) Doors leaking one hour after the charge will be adjusted prior to the end of the second hour after the charge.

(iii) Each oven door leaking one hour after the charge will be reinspected for visible emissions two hours after the charge. A record will be made of any door leaking two hours after the charge.

(iv) Any door leaking two hours after each of two successive charges must be replaced with a repaired or rebuilt door prior to the next charge to that oven.

(v) An adequate supply of repaired and rebuilt doors will be maintained on site to allow the frequency of replacement necessary to comply with this section.

(vi) If a newly installed, rebuilt or repaired door leaks more than two hours after the charge, the door and jamb must be inspected when the door is next removed from the oven. If the door is found to be defective, it must be replaced with a repaired or rebuilt door to that oven as soon as it is reasonably possible, normally within two charges to that oven. If the door is not found to be defective, the jamb must be replaced as soon as it is reasonably possible.

(2) Luted doors.

(i) Luted doors leaking 15 minutes after the charge must be immediately reluted.

(ii) Doors that fail to seal after the first reluting must be recorded.

(iii) Leaks appearing after the first reluting must be reluted immediately.

(3) Chuck doors.

(i) Chuck doors must be inspected within one hour after the charge. A record must be made of any chuck door leaking one hour after the charge.

(ii) Chuck doors leaking one hour after the charge must be gasketed or luted, prior to the next charge to that oven.

(iii) If a freshly gasketed door is leaking one hour after the charge, the gasket or the oven door shall be replaced prior to the next charge to that oven.

(iv) If a luted chuck door is leaking one hour after the charge, it must be reluted.

(4) All doors and jambs will be cleaned completely prior to each charge.

(5) Records of inspections required by this section, including the names of inspectors, the date and time of each door inspection, and ovens observed leaking must be maintained.

(6) Work practices other than the above may be substituted after approval by the commissioner.

(d) Work practice and maintenance plan. Any person who owns a by-product coke oven battery must submit a proposed work practice and maintenance plan to the office which issued the certificate to operate for that source. The work practice and maintenance plan must be approved before the by-product coke battery may be operated. The plan must include:

(1) the name and title of the person responsible for oven door maintenance;

(2) the procedures to be followed to assure compliance with subdivision 214.7(c);

(3) the number of replacement doors and jambs kept on site for each battery; and

(4) the coal charging procedures.

214.8 Charging hole lids and offtake piping.
(a) Charging hole lids. No more than 2% of all oven lids may emit visible emissions as measured in accordance with the procedure set forth in subdivision 214.8(c).

(b) Offtake piping. No more than 10% of the offtake piping on a single battery may emit visible emissions, as measured in accordance with the procedure set forth in subdivision 214.8(c).

(c) For the purpose of determining compliance with section 214.8(a) and (b) of this Part, visible emissions are those emissions of any degree of opacity greater than zero observed to be leaking from any point on the battery topside except from oven flue caps and between refractory bricks.

(1) Compliance with the standard for charging hole lids will be determined while walking topside along the length of the battery, observing each oven lid for only that time necessary to determine whether or not there is a visible emission coming from the charging hole casting and lid interface, but will not include smoke from burning of smoldering excess topside coal. The observer will then shift attention to the adjacent oven lids and check for emissions in the same manner. The observer will continue this procedure along the entire length of the battery. For the purpose of inspection, an ignited dampered oven requires that a flame is observed above any one charging hole. The dampered oven will be included in the calculations for determining the percentage of leaking lids if there is no flame visible above the plane of the opening on any single charging hole. The percentage of leaking lids will be calculated by dividing the number of leaking lids by the total number of lids on the in-service ovens on the battery and multiplying by 100. Oven lids on a maximum of six dampered ovens are exempt from this procedure provided they are ignited.

(2) Compliance with the standard for offtake piping will be determined while walking topside as close as possible to the

centerline of the battery and observing the offtake piping of each oven for only that time necessary to determine whether or not there is a visible emission coming from the offtake piping on that oven. In the event such positioning results in an obstructed view, the observer may assume other positioning to allow a clear view of the emissions. The observer will then shift attention to the adjacent offtake piping and check for emissions in the same manner. The observer will continue this procedure along the entire length of the battery. For the purpose of inspection, an ignited dampered oven requires that a flame is observed above any offtake piping cap opening. The dampered oven will be included in the calculations for determining the percentage of leaking offtake piping if there is no flame visible above the plane of the opening on the offtake pipe. The percentage of leaking offtake piping will be calculated by dividing the number of leaking offtake piping by the total number of offtake piping on the in-service ovens on the battery and multiplying by 100. Offtake piping on an oven being charged and on a maximum of six dampered ovens including an oven being pushed is exempt from this procedure provided that emissions from the dampered ovens are ignited once the oven is dampered.

214.9 Gaseous Emissions. (a) Coke oven fuel gas-sulfur recovery/desulfurization systems. No person may operate any by-product coke oven battery, including auxiliary gas collecting and heating systems, in such a manner as to emit, burn or flare coke oven gas containing more than 0.5 grains of sulfur compounds (measured as hydrogen sulfide) per dry standard cubic foot of total coke oven gas produced. If the source owner can demonstrate to the satisfaction of the commissioner, by an acceptable air quality impact analysis, that the emissions will not contribute to the contravention of any applicable sulfur dioxide ambient air quality standard and will not significantly degrade air quality, the commissioner may permit the use of coke oven gas containing sulfur compounds in excess of the amount specified above provided that a sulfur recovery/desulfurization system approved by the commissioner, is installed and operated.

(b) Other gaseous emissions. With the exception of the sulfur compounds regulated by subdivision 214.9(a), Part 212 or other applicable Parts of this subchapter apply to other gaseous emissions from by-product coke oven batteries.

214.10 Exceptions. (a) Upon written application by a source owner to the office which issues the certificate to operate for that source, the commissioner may apply less stringent emission standards than required by this Part for any existing by-product coke oven battery, if the source owner demonstrates:

(1) That the less stringent emission standards will not result in or contribute to the violation of any ambient air quality standard; and

(2) The required costs of controls are unreasonable because of plant age, location or process design; or

(3) The physical impossibility of installing necessary emission control equipment; or

(4) Other factors specific to the emission source that make application of the standard unreasonable.

(b) A source owner required to comply with the coke pushing and transport emission control requirements specified in subdivision 214.4(a) may be exempted from such requirements upon the acceptance by the commissioner of an alternative emission reduction plan submitted to the office which issues the Certificate to operate for that source by the source owner. The plan shall become effective upon approval by the Environmental Protection Agency. In order for such a plan to be acceptable, the following requirements must be met:

(1) A complete emission inventory for all coke making sources must be included in the alternative emission reduction plan which show no net increase in coking emissions; and

(2) Air quality dispersion modeling must show that the submitted coke making inventory, when modeled in place of the plant's coke making emission inventory in the State Implementation Plan, will show attainment of the air quality standards off-plant property.

(c) Any source owner subject to the opacity requirements of subdivision 214.4(b) or 214.6(a) may apply in writing to the office which issues the certificate to operate for that source and will be granted an equivalent opacity if either of the following conditions are met:

(1) If the source owner can demonstrate through tests done in compliance with Part 202 that the source is in compliance with all applicable emission requirements other than the opacity standard and that the source and any associated emission control is being operated and maintained in a manner to minimize the generation of visible emissions; or

(2) The source owner has obtained approval for an alternative emission reduction plan under subdivision 214.10(a) or (b) which covers the source for which equivalent opacity is desired.

(d) Any exception granted under this section must be incorporated in an enforceable legally binding agreement between the source owner and the Department.

214.11 Test procedures. (a) Coke pushing and transport, and waste heat (underfire) stack. Stack testing procedures for determining compliance with the standards set forth in subdivisions 214.4(a) and 214.6(a) will be conducted in accordance with methods acceptable to the commissioner. The methodology specified in Appendix A of Part 60 of Title 40 of the Code of Federal Regulations and all future technical revisions, additions, or corrections made thereto shall be considered acceptable except where the commissioner has required a specific method. If the control

device cannot be tested in accordance with those methods, appropriate test methods will be determined by the Commissioner in accordance with Part 202. During each stack test performed, simultaneous visible emission evaluations must be conducted and a copy of the raw data sheets must be included with the test report. The report must include actual sampling times to allow a comparison between the visible emissions and the stack test results. During each stack test performed, the source owner must provide access to production data and other parameters necessary for determining compliance. During each run of a stack test, the source to be tested will be operated at a production level at least as large as the average production level during the three months prior to the first day of testing. Unless modified below, compliance will be determined by averaging three runs. Testing will be performed on a sufficient number of pushing and transport operation cycles in order to achieve a minimum of a one hour duration test run.

(1) If a mobile evacuation and emission control system is used, compliance will be determined by the use of a pushing emissions test car. The car must be supplied by the source owner in order to perform these tests and must contain the necessary duct extension to perform the test.

(2) If a positive pressure baghouse control system is used any grating or other openings of the baghouse compartments which may admit outside air into the baghouse must be sealed during the sampling periods.

(3) If a modular baghouse is used and the baghouse contains more than five stacks, the owner must perform one test run per stack. Compliance will be determined by computing the mass emission rate, in pounds per hour, for each stack and then summing each of these mass emission rates. During all test runs, the production rate must be maintained within ten percent of the mean rate for the entire sampling period.

(4) To determine compliance with the pound per ton mass emission standard, the measured particulate concentration will be multiplied by the volumetric flow rate at standard conditions (20° centigrade(C), 760 millimeters(mm)) measured at the sampling point and divided by the number of tons of coal charged to the ovens that were pushed during the test.

(5) Pushing emission control sheds.

(i) The sampling of a push will begin with the initial movement of the ram pushing the coke out of the oven. Sampling will end three minutes later unless the ram becomes stuck before the coke is completely pushed out of the oven. If the ram does become stuck in the oven, sampling will be discontinued during the time of no significant emissions generation and will resume when the ram moves the coke again. The sampling period for that push will end when three minutes of sample have been collected.

(ii) A sufficient number of visible emission observers will be used to observe all sources of visible emissions during the mass emission test.

(b) Coke oven fuel gas-sulfur recovery/desulfurization systems. For the purpose of determining compliance with the coke oven gas standard of 0.5 grains of sulfur compounds (measured as hydrogen sulfide) per dry standard cubic foot of total coke oven gas produced or alternative limits approved by the commissioner, the following test procedures must be followed:

(1) The owner or operator must submit a schematic diagram of the coke oven gas main distribution system immediately downstream of the exhausters. This schematic diagram must include gas flow rates in dry standard cubic feet per minute for the sampling points selected to determine the sulfur compound concentrations in coke oven gas used, emitted or flared. Flow rates are not required when analysis indicates the total coke oven gas sulfur concentrations prior to desulfurization is below 0.5 grains per dry standard cubic foot of sulfur compounds (measured as hydrogen sulfide).

(2) Where gas flow rates are required, the source owner must use an orifice flow rate measuring device or equivalent at the time of sampling.

(3) The designated sampling points must be accepted and approved in accordance with Part 202. Using the Tutweiler method of analysis, take a minimum three samples, one per hour, at each required sampling point.

(4) The concentration of sulfur compounds at each sampling point is determined by averaging the total of each group of three samples.

(5) Compliance determination is established by calculating the flow-weighted average of all required sampling points for the total coke oven gas produced.

(c) Wet quench towers. Emission testing must be done in accordance with methods acceptable to the commissioner. The reference methods specified in Appendix A of Part 60 of Title 40 of the Code of Federal Regulations as modified below shall be considered acceptable. The source owner may propose alternative methods in compliance with Part 202.

(1) A cyclone with a cut size of three to ten micrometers must be placed ahead of the sampling probe. The volume of the liquid removed by the cyclone should be reported in the test report. The liquid should be evaporated at room temperature and the weight of the solid residue should be recorded and included as a part of the front half catch.

(2) The gas velocity at each sampling point in the quench tower must be measured and continuously recorded on a strip

chart or by means of another equivalent automated system during a normal quench. The two gas sampling rates will be determined from the recorded relationship of stack gas velocity over time. One of these flow rates is the peak observed during the middle of the quench. The other flow rate is normally one-half to two-thirds the peak and represents the average flow during the early and late stages of the quench when the stack velocity is increasing and decreasing. The actual flow rates during stack sampling must be at the lower level for the time it takes the stack velocity to reach the peak, at the high rate during the peak and at the lower level during the time the flow rate is decreasing from the peak.

(3) Sampling of an individual quench will begin with the entrance of the quench car into the tower and will end with the exit of the car from the quench tower.

(4) A sufficient integral number of quenches must be sampled to collect the same number of samples from each probe location and the total sample volume required by the reference methods.

(5) The sampling probes must be located at least five feet above the baffles and at least five feet below the top of the tower.